

**BEFORE THE SUBCOMMITTEE ON CLEAN AIR,
CLIMATE CHANGE, AND NUCLEAR SAFETY
ENVIRONMENT AND PUBLIC WORKS COMMITTEE,
UNITED STATES SENATE**

**HEARINGS ON THE ENVIRONMENTAL PROTECTION AGENCY'S
PROPOSED REVISIONS TO THE PARTICULATE MATTER AIR QUALITY
STANDARDS**

**TESTIMONY OF
CONRAD G. SCHNEIDER
ADVOCACY DIRECTOR, CLEAN AIR TASK FORCE**

July 13, 2006

Mr. Chairman and distinguished members of the Subcommittee,

Introduction

My name is Conrad Schneider, and I am the Advocacy Director of the Clean Air Task Force, a nonprofit organization dedicated to restoring clean air and health environments through scientific research, public education and legal advocacy. The Task Force appreciates the opportunity to appear before you today and offer our views on the United States Environmental Protection Agency's proposed revisions to the particulate matter air quality standards.¹

Overview

1. Further reductions in fine particulate pollution (PM_{2.5}) are a matter of life and death for tens of thousands of Americans each year.
2. The proposed revisions to the particulate matter standards, while an improvement over the current standards, do not go far enough in protecting human health. EPA should tighten its proposed particulate matter standards to protect public health with an adequate margin of safety by tightening both the annual and daily particulate matter standard and setting a coarse particle standard. Tightening the annual and daily PM_{2.5} standards could save as many as 10,000 additional lives per year. Certainly, EPA cannot justify adopting standards any less stringent than those recommended by its own independent Clean Air Science Advisory Committee (CASAC).
3. While the issues of cost and implementation are outside the scope of EPA's review of the ambient air quality standard, the Subcommittee should note that the current and proposed PM_{2.5} standards are achievable, cost-benefit justified, and can be met with affordable, available technologies that will not damage America's economic vitality or the economic health of the sectors of the economy that must take primary responsibility for the needed reductions.
4. For better or worse, the regulatory impact of any new particulate matter standards will be far into the future. Once the new particulate matter standards are finalized, designations will not be made until 2010. Initial attainment plans will be due in 2013 with the first deadline for attainment not until 2015 with the possibility of a five-year extension until 2020 and two one-year extensions thereafter.
5. It is premature to conclude that the proposed new particulate matter standards will be difficult or impossible to achieve, however, EPA and the states need to focus on the needed suite of federal control measures and potential model state programs to ensure timely attainment is achieved.

¹ EPA, National Ambient Air Quality Standards; Proposed Rule 40 C.F.R. Part 50 p. 2620 January 27, 2006 available online at: www.epa.gov/fedrgstr/EPA-AIR/2006/January/Day-17/a177.pdf

We know enough today to know that a cost-effective program for attainment of the existing and proposed PM_{2.5} standards² would include:

- (A) EPA setting a tighter national or regional cap on sulfur dioxide from power plants;
 - (B) States requiring tighter sulfur dioxide controls on power plants that have a significant impact on nearby nonattainment areas;
 - (C) EPA completing the process of tightening emission standards for new locomotive and marine diesel engines and issuing regulations that require existing, on-road diesel engines meet tighter emission standards when they are rebuilt; and
 - (D) States and local governments requiring additional PM_{2.5} reductions from public and private diesel fleets.
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- 6. Senators Carper and Voinovich in the legislation they are pursuing, the Clean Air Planning Act of 2006³ and funding for the Diesel Emission Reduction Act of 2005⁴, are taking exactly the right approach focused on the power industry and America's diesel fleets as the largest contributors to the problem, and the most cost-effective contributors to the solution.
 - 7. U.S. EPA through its Clean Air Interstate Rule (CAIR) and the new on- and non-road diesel engine rules has taken two important steps in reducing PM_{2.5} pollution. But, the reductions from CAIR will provide "too little, too late" to provide states the reductions they need from the power sector to meet their attainment obligations on time.
 - 8. U.S. EPA in the CAIR rule has tied the hands of the states by making obtaining additional power plant reductions beyond CAIR more difficult than necessary. By providing strong disincentives for states seeking the most cost-effective incremental PM_{2.5} reductions (i.e., additional SO₂ reductions from power plants), this "special treatment" afforded the power sector is forcing states to turn to more expensive, less cost-effective sources (industrial point sources and small businesses, etc.) for the needed PM_{2.5} reductions.
 - 9. Congress should leave alone the existing statutory and regulatory process for setting and revising National Ambient Air Quality Standards (NAAQS). The current standard-setting provides an excellent example of what we all should want, namely science-driven policy. Instead of altering the process, EPA should be urged to better respect the statutory deadlines for proposing revisions and raise the priority it gives timely implementation of the standards. If it takes any action at all on PM_{2.5} implementation, Congress should fully restore funding for the states' air grant program in the current EPA appropriations bill and ensure that states have the necessary resources to

² Excepting California which has adopted a 12 ug/m³ annual PM standard which the California Air Resources Board recognizes will require a suite of reductions, including in the automotive and port emissions sectors, in order to attain.

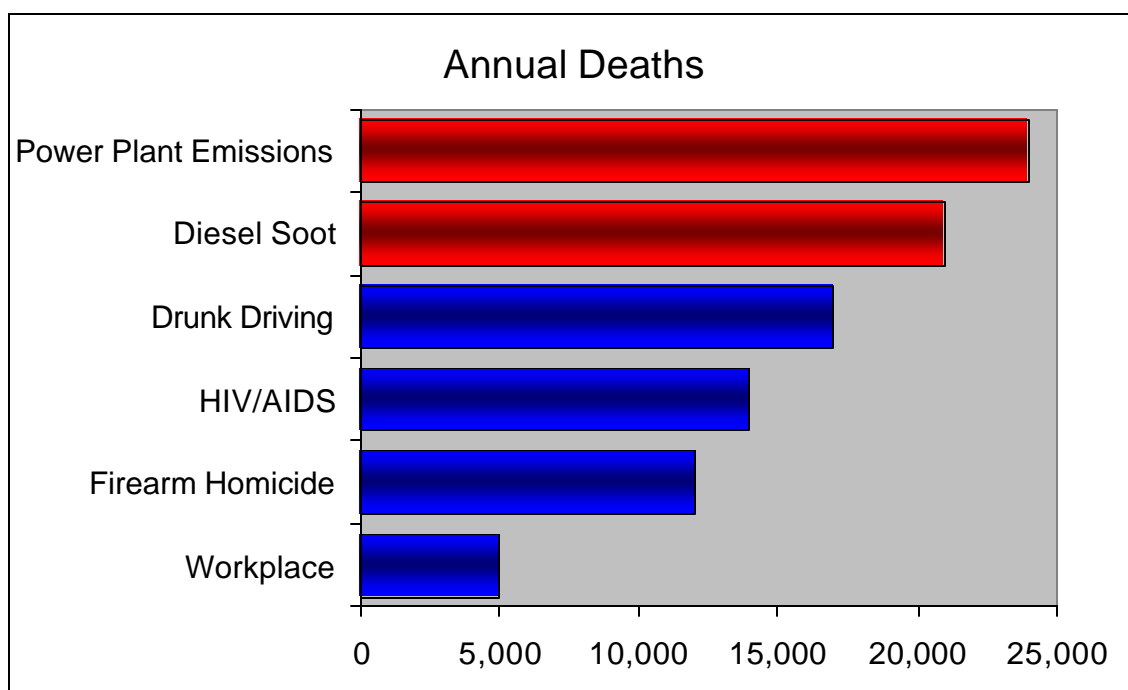
³ The Clean Air Planning Act of 2006, S. 2724.

⁴ The Diesel Emissions Reduction Act of 2005, S. 1265.

submit adequate State Implementation Plans (SIPs) that will allow them to attain the existing and new PM_{2.5} standards on time.

A. Particulate Matter is a Matter of Life and Death

From the perspective of human health, particulate matter is the most important pollutant that is regulated by the U.S. EPA, period. Unlike any other pollutant, particulate matter cuts short the lives of tens of thousands of Americans each year. Estimates by EPA's leading air programs benefits consulting firm, Abt Associates, have found that PM_{2.5} from power plants and diesel engines together lead to the premature deaths of nearly 45,000 Americans each year. In Ohio alone, diesel and power plant pollution is responsible for the premature deaths of approximately 2,500 people each year.



The mortality risk from power plant and diesel particulate matter exceeds that from drunk driving and AIDS combined. In terms of human health impacts, particulate matter represents a threat that is an order of magnitude greater than any other risk that EPA regulates or that this Subcommittee oversees. PM_{2.5} poses a greater health threat than that posed by ozone, radon, dioxin, PCBs, or mercury. Diesel exhaust alone poses a greater cancer risk than all the 133 other air toxics that EPA tracks in its National Air Toxics Assessment database.⁵ In polluted cities, the mortality risk of breathing the levels of fine particles in the ambient air is comparable to the risk posed by living with a

⁵ Clean Air Task Force, "Diesel and Health in America: The Lingering Threat," February 2005 available online at: http://www.catf.us/publications/reports/Diesel_Health_in_America.pdf

smoker.⁶ In terms of environmental health priorities, setting and achieving protective particulate matter standards should be Job #1 for EPA.

B. The Proposed Revision to the Particulate Matter Standards Fails to Protect Public Health with an Adequate Margin of Safety

Scores of peer-reviewed, published health studies since 1997 have demonstrated, and EPA has acknowledged, that the current standards provide inadequate protection for those who live in areas even with moderate levels of particulate matter. The Clean Air Task Force estimates there is a difference of as many as 10,000 avoidable deaths in meeting an annual standard of 12 ug/m³ or 14 ug/m³ (17,900 and 10,100 avoided deaths, respectively) relative to the current 15 ug/m³ annual standard (7,400 avoidable deaths).

Under the Clean Air Act, primary standards must protect public health, including the health of sensitive populations, with an adequate margin of safety. Secondary standards must protect public welfare, including important adverse effects such as visibility impairment and damage to materials and crops. The current EPA proposed revisions to the particulate matter standards fail on both counts.

The adverse health effects of particulate matter are serious and have been well documented in EPA's Criteria Document and Staff Paper. The thousands of studies published over the last nine years make a much stronger case for the regulation of fine particles than in 1997, and indicate that the current standards must be lowered to protect public health.

Community health studies have consistently demonstrated associations between daily increases in fine particles and decreased lung function, exacerbation of asthma, more frequent emergency department visits, increased risk of heart attacks and strokes, additional hospital admissions, and increased number of daily deaths. These effects have been demonstrated in cities where the daily concentrations of PM_{2.5} are well below the current standard and rarely reach the level of the proposed 24-hour standard. Furthermore, the form of the proposed standard excludes too many of the most polluted days from compliance determinations.

Long term exposures to fine particles are implicated in premature death from heart disease, lung disease, and lung cancer. The average number of life-years lost by individuals dying prematurely from exposure to particulate matter is 14 years.⁷ EPA's risk assessment demonstrates that thousands of premature deaths attributable to particulate air pollution are occurring each year under the current standard, and that the proposed standards would do little to reduce this toll.

Building on earlier work, the largest ever epidemiological study of the effects of PM_{2.5} in

⁶ NYU Press release, March 5, 2002. Most Definitive Study Yet Shows Tiny Particles in Air Are Linked to Lung Cancer; Pope, C.A, Burnett, R.T., Thun, M.J., Calle, E.E., Krewski, D., Ito, K., and Thurston, G.D., "Lung Cancer, Cardiopulmonary Mortality, and Long Term Exposure to Fine Particulate Air Pollution, Journal of the American Medical Association, Vol. 287 (2002), p. 1132-1141.

⁷ U.S. EPA, OAR, "Final Report to Congress on Benefits and Costs of the Clean Air Act, 1970 to 1990", EPA 410-R-97-002 (October 1997) at I-23.

204 U.S. counties was published in the *Journal of the American Medical Association* in March 2006.⁸ This study showed clearly that the proposed standards for PM_{2.5} fail to protect public health as required by the Clean Air Act. In this study, the average of the county mean annual values was 13.4 µg/m³—well below the proposed standard of 15 µg/m³. At levels below what EPA proposed as an annual standard, the findings showed cardiovascular and respiratory hospital admissions for the elderly increasing as concentrations PM_{2.5} increased. Significant associations with excess cardiac and respiratory admissions persisted even after excluding all days above 35 µg/m³ (the level of the proposed daily standard) from the study.⁹ Even where PM_{2.5} concentrations met *both* the proposed annual and 24-hour standards, serious health effects occurred.

Furthermore, a follow-up to the Harvard Six Cities Study published in March 2006 documented the life-saving benefits from reduced particulate levels. That study found that an average of three percent fewer people died for every reduction of one µg/m³ in the annual average levels of PM_{2.5}.¹⁰ In fact, the lead researcher said that the reductions in particulate matter in the U.S. that have taken place during the study period are saving the lives of 75,000 Americans each year.¹¹

According to EPA's Children's Health Protection Advisory Committee, the proposed annual PM_{2.5} standard does not provide the required adequate margin of safety to protect infants and children. The Committee concluded that the proposed daily PM_{2.5} standard must also be revised downward to protect public health.¹² The Clean Air Scientific Advisory Committee to the EPA has indicated that PM_{2.5} causes adverse health effects including premature death at annual concentrations below the current standard, and has reiterated its recommendations for lowering the annual standard.¹³

Coarse particles are associated with increased hospitalization for respiratory infections in children, decreased lung function, increased hospital admissions for heart disease, increased hospital admissions for respiratory disease in the elderly and increased risk of premature death. EPA proposes a daily coarse particle standard that would be higher than levels where serious health effects have been reported in the studies EPA reviewed. EPA would enforce the standard only in urban areas with populations above 100,000, and exempt mining and agricultural sources of particles. EPA must set a coarse particle standard that applies nationally and without exemptions, to protect the health of all Americans as the

⁸ Dominici F, Peng RD, Bell ML, Pham L, McDermott A, Zeger SL, Samet JM. Fine Particulate Air Pollution and Hospital Admission for Cardiovascular and Respiratory Diseases. *JAMA* 2006; 10:1127-1134.

⁹ Letter from Francesca Dominici to U.S. EPA, March 23, 2006. Docket ID No. EPA-HQ-OAR-2001-0017-0988.

¹⁰ Laden F, Schwartz J, Speizer FE, Dockery DW. Reduction in Fine Particulate Air Pollution and Mortality: Extended Follow-up of the Harvard Six Cities Study. *Am J Respir Crit Care Med* 2006; 173: 667-672.

¹¹ <http://www.hsph.harvard.edu/press/releases/press03152006.html>

¹² Letter from Melanie A. Marty, Ph.D., Chair, EPA Children's Health Protection Advisory Committee, to Stephen L. Johnson, Administrator, U.S. Environmental Protection Agency, RE: Proposed NAAQS for Particulate Matter, March 3, 2006.

¹³ Dr. Rogene Henderson, Chair, Clean Air Scientific Advisory Committee letter to Stephen L. Johnson, Administrator, U.S. Environmental Protection Agency, March 21, 2006, Subject: Clean Air Scientific Advisory Committee Recommendations Concerning the Proposed National Ambient Air Quality Standards for Particulate Matter, EPA-CASAC-LTR-06-002.

Clean Air Act requires. Furthermore, EPA must not revoke the PM₁₀ standard in any area of the country without providing protection against backsliding. The Children's Health Protection Advisory Committee has recommended that the level of the coarse particle standard be lowered, that standards apply nationwide, with monitoring in both urban and rural areas, and that the exemption for agriculture and mining be withdrawn. The Clean Air Scientific Advisory Committee has also opposed exempting specific industries and recommended establishment of a national coarse particle monitoring program in urban and rural areas. We have urged EPA to lower both the annual average and the 24-hour fine particle standard, while tightening the way compliance with the standards is measured.

We have urged EPA to adopt protective coarse particle standards that will apply nationwide, with monitoring in both urban and rural areas. We oppose the special exemptions for agribusiness and mining. In addition, we have said that we believe that EPA must establish secondary standards for fine particles that protect against deterioration of visibility caused by fine particle pollution, as recommended by the Clean Air Scientific Advisory Committee, and set secondary standards for coarse particles that apply nationwide to protect against the ecosystem damage and visibility degradation they cause.

C. Tightening the PM_{2.5} Standards will not Result in Broad Swaths of the U.S. Being Designated in Nonattainment

Critics of tighter PM_{2.5} standards have warned that if the standards are tightened, hundreds of U.S. counties will be branded with the stigma of nonattainment. However, in making these claims, these critics have conveniently ignored the benefits of the CAIR rule in the East.

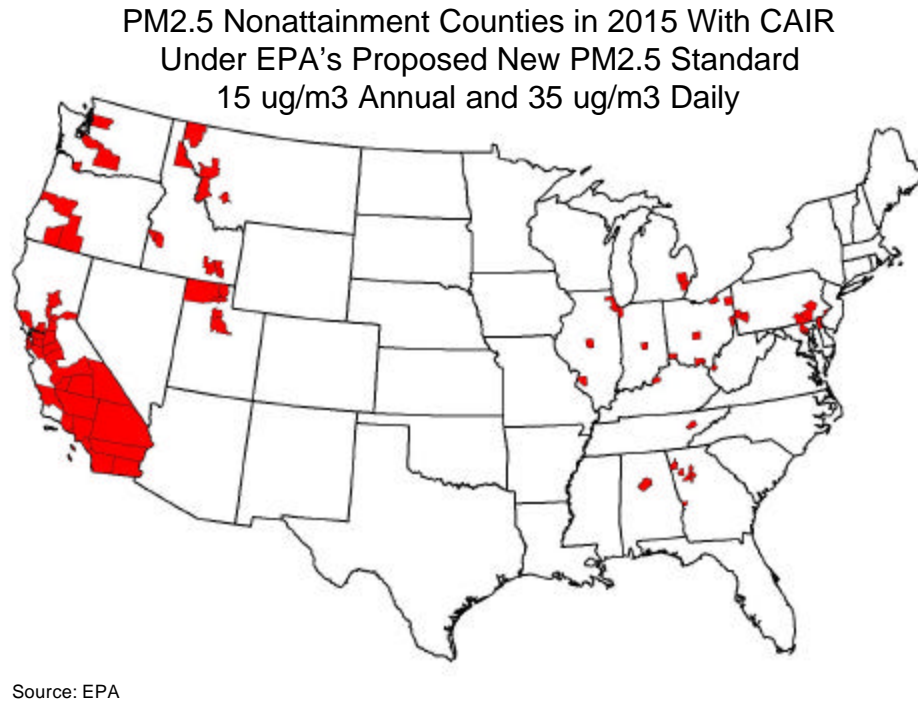
Here is a map showing the counties that currently are monitoring nonattainment:

PM_{2.5} Nonattainment Counties (1999-2003 Design Values)
Under Current EPA Standards



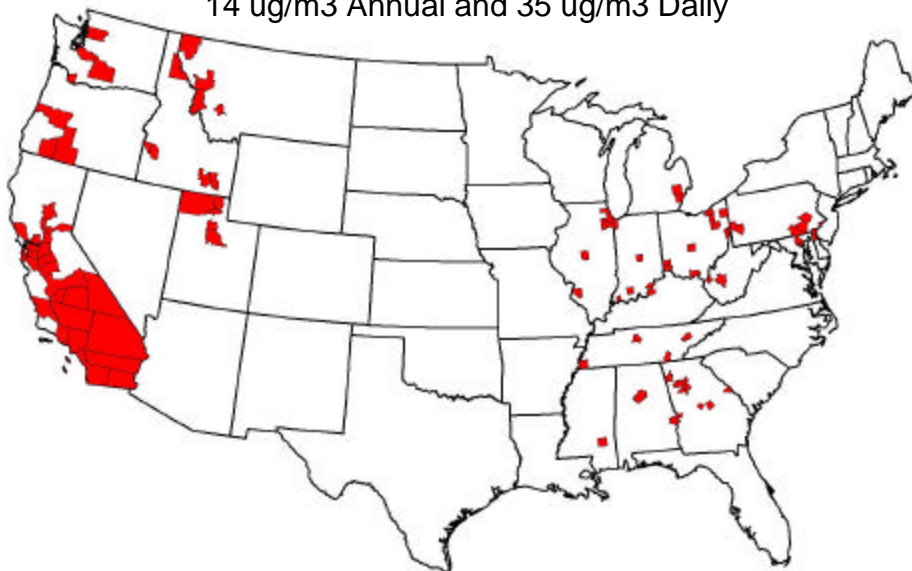
Source: EPA

EPA has proposed retaining the current annual $\text{PM}_{2.5}$ standard and tightening the daily standard to 35 ug/m^3 . Here is a map of the counties that would be in nonattainment on the first statutorily-required attainment date, 2015, with the CAIR rule:



You can see that even with the proposed tighter daily standard, with the CAIR rule fewer counties are in nonattainment in 2015 than are in nonattainment today. Even if the annual standard was tightened from 15 ug/m^3 to 14 ug/m^3 , although some western counties would violate the new standard, the number of nonattainment counties post-CAIR does not grow significantly. See map below:

PM_{2.5} Nonattainment Counties in 2015 With CAIR
Under a More Stringent PM_{2.5} Standard
14 ug/m³ Annual and 35 ug/m³ Daily



Source: EPA

D. Protective PM_{2.5} Standards are Achievable with currently available, affordable technology

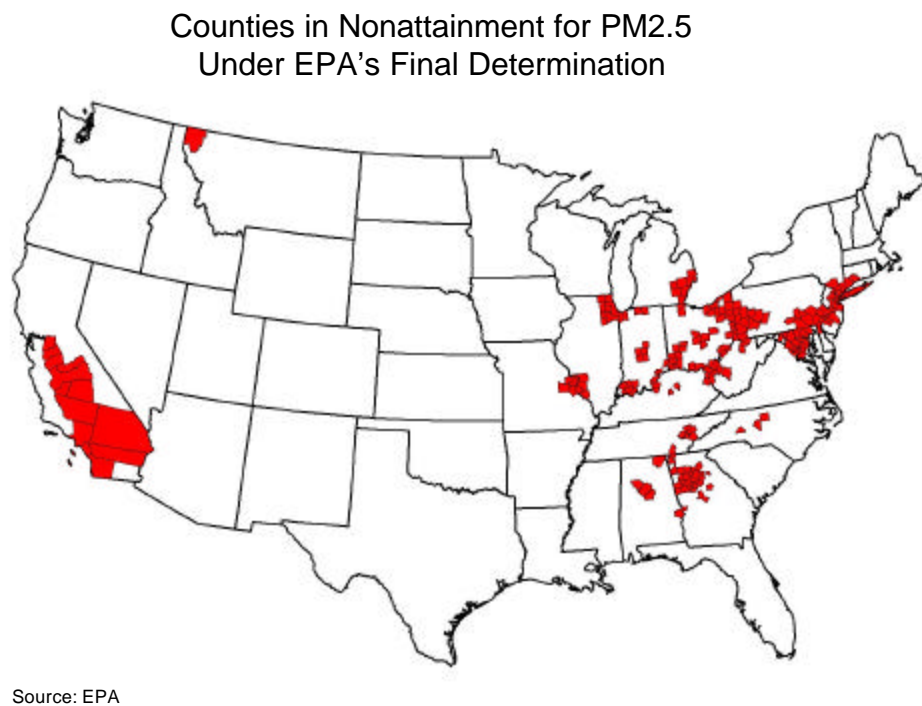
1. EPA Should Establish Tighter National and Regional Caps on Power Plant Sulfur Dioxide and Nitrogen Dioxide

Fortunately, the solutions to the problem of PM_{2.5} pollution are well-understood and achievable today with available, affordable technology.¹⁴ The biggest single contributor to the problem of PM_{2.5} is sulfur dioxide emissions from coal-fired power plants which convert to particulate matter through photochemical changes in the atmosphere. The U.S. power sector currently emits over 10 million tons of sulfur dioxide each year. Sulfur dioxide emissions from power plant boilers can be reduced by 90-95 percent through the installation of Flue Gas Desulfurization (FGD) devices commonly known as “scrubbers”. Power plant nitrogen oxides can be cut by over 80 percent by application of Selective Catalytic Reduction (SCR) technology. While installing these controls constitutes a major capital investment for their owners, EPA in its recent CAIR rule RIA estimates that FGD devices can reduce SO₂ for less than \$2000/ton and SCR can reduce NO_x for less than \$1000/ton. These installations on power plants represent the “low-hanging” fruit for PM_{2.5} control because there are no more cost-effective reductions available than these.

¹⁴ The State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials (STAPPA/ALAPCO) recently issued “*Controlling Fine Particulate Matter Under the Clean Air Act: A Menu of Options*” (March 2006) that identifies the many feasible controls that are available for reducing particulate matter emissions. Available online at: <http://www.4cleanair.org/PM25Menu-Final.pdf>

EPA's Clean Air Interstate Rule (CAIR) requires a 60+ percent cut in SO₂ and NO_x emissions from power plants in the Eastern U.S. by 2015 [although EPA predicts that the banking feature of the program will mean that this level of reduction will not actually be achieved in any given year before 2020]. While the CAIR rule reductions represent an important step forward in PM_{2.5} control, the cuts come too late to afford states the interstate transport pollution reductions they need by the 2010 attainment date of the current standard. Indeed, the CAIR rule still leaves over 78 million Americans living in areas that violate the current standards for PM_{2.5}. EPA should have required deeper, faster cuts from the power sector as part of this rule to help the states attain the standard on time. The rule could have produced highly cost-effective reductions of at least one million more tons of SO₂. In addition, by EPA's own admission, under CAIR 21 percent of the nation's coal plants still would not have basic sulfur scrubber technology even by 2020.

The map below shows EPA's final designations for PM_{2.5} nonattainment areas:



Under the Clean Air Interstate Rule, the number of areas in nonattainment in 2010 and 2015 fall dramatically. See maps below:

PM2.5 Nonattainment Areas with CAIR in 2010



Source: EPA

PM2.5 Nonattainment Areas with CAIR in 2015



Source: EPA

Nevertheless, even with the CAIR rule in 2010 14 areas will still be in nonattainment of the PM_{2.5} annual standard. If a national SO₂ cap of 2 million tons was set, that number would fall to 8 areas. The recently introduced Clean Air Planning Act of 2006 would set a nationwide SO₂ cap of 2 million tons per year starting in 2015 with a first phase in 2010 of 4.5 million tons per year. See map below:

PM2.5 Nonattainment Areas With a Two Million
Ton per Year National Sulfur Dioxide Cap in 2015



Source: MSB Energy Associates;
Calculated Using EPA Methodology

These residual, post-CAIR nonattainment areas include Cleveland, Chicago, Atlanta, and Detroit where targeted additional power plant and local diesel measures could make up the difference.

Besides delivering inadequate reductions in a timely fashion, the CAIR rule contains another, perhaps more egregious flaw. The CAIR rule limits the ability of states to “take a second bite at the apple” in terms of additional reductions from power plants. This is very important because, as is detailed below, additional cuts in power plant pollution are the most cost-effective additional controls that states can require (i.e., the next “lowest-hanging fruit”). By discouraging states from seeking additional reductions from the power sector beyond CAIR, EPA forces states to look to relatively more costly controls on their industrial point sources and small area sources which generally are smaller businesses.

The CAIR rule limits the states’ ability to seek additional power sector reductions by placing strict rules on states’ ability to participate in the regional CAIR emission trading program. As we know, the CAIR framework derived from the “sweetheart” deal between the Bush Administration and the electric generating industry known as the “Clear Skies” legislation. CAIR follows the “Clear Skies” template in attempting to fashion a “safe harbor” for the power sector to limit additional reductions from power plants. Here’s how: EPA’s 2005 CAIR rulemaking requires many states across the eastern and Midwestern US to reduce emissions of NO_x and SO₂ between 2009-10 and 2015. EPA has promulgated “model trading rules” for states to adopt that provide for reduction of these pollutants from power plants via a regional cap and trade system. However, many states in the eastern half of the country believe that the level and timing of these power plant reductions are not sufficient to allow attainment of the ozone and PM NAAQS, and that emissions reductions from most other sources will be more costly. As a result, many

states, led by the Ozone Transport Commission, are considering requiring additional reductions from power plants in much of the CAIR region. EPA, however, has not cooperated with the states in these efforts, even though such reductions would clearly benefit public health and the environment, and are expressly authorized by Section 116 of the Clean Air Act.

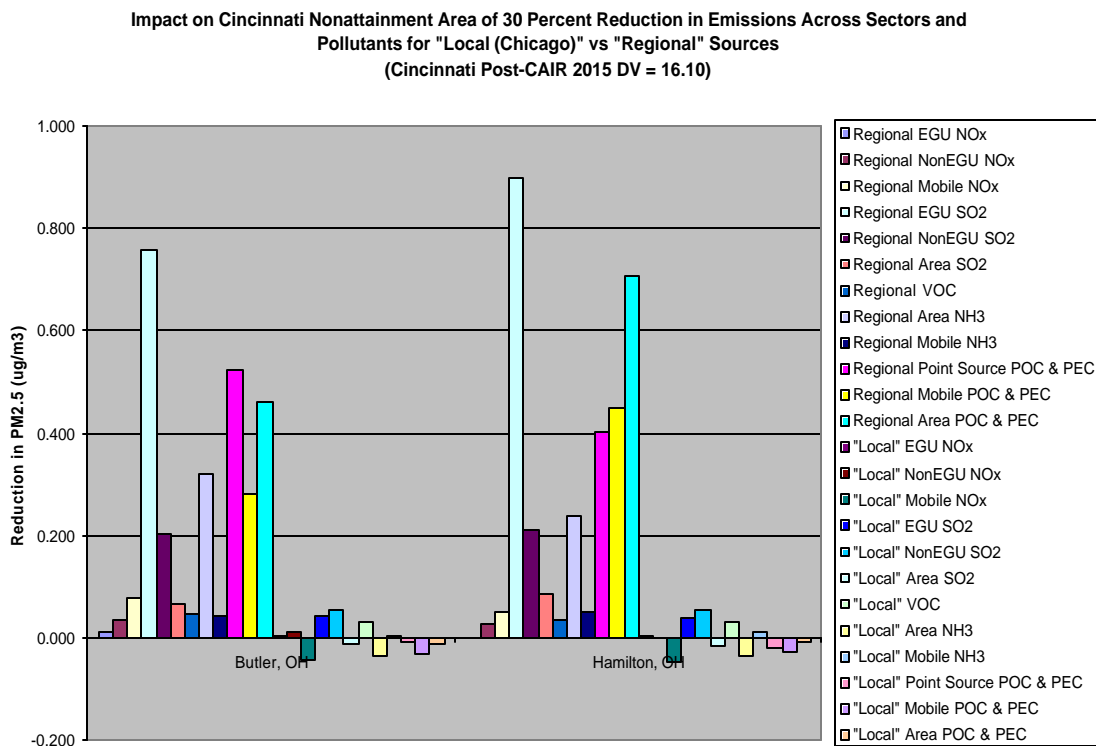
Rather, EPA has discouraged states from reducing power plant emissions, especially emissions of SO₂, beyond those reductions called for in CAIR. Essentially, EPA has made it easy for states to adopt CAIR, and difficult for states to go beyond CAIR. Thus, the CAIR requirements for states adopting EPA's model power plant trading rules are simpler and less onerous than the requirements for states that seek to achieve the necessary emission reductions in some other way. In addition, EPA will allow states to submit streamlined SIPs that contain the CAIR model rules; in order to take advantage of this streamlined approach, however, states can only make limited changes to EPA's CAIR approach. Importantly, the changes that EPA will accept in streamlined CAIR SIPs ***do not include a more stringent SO₂ reduction requirement***. Due to the resource constraints facing many state environmental agencies (constraints which EPA's proposed 2006 budget only makes worse), it may be quite tempting for many states to accept EPA's streamlined approach, thereby saving time and resources, even at the expense of foregoing requirements for additional emission reductions.

EPA has gone even further, and indicated that it will not approve state SIP submissions that include more stringent SO₂ power plant limits. And, if states do not get their SIPs into EPA on time, EPA recently finalized a rule that will automatically impose on such states federal requirements that mirror EPA's CAIR model trading rule for power plants. EPA's use of a federal implementation plan (FIP) in this way is highly unusual. Historically, EPA has been extremely reluctant to issue FIPs on states that do not meet SIP submission requirements (usually EPA does so only after a court order resulting from a citizens' suit). Here, however, EPA has issued the FIP before the SIP deadline has even expired, and one of the primary effects of such a FIP is to encourage states to implement CAIR using the quickest and easiest administrative route—that is, by adopting without meaningful change the CAIR model trading rules (including CAIR emission limits and deadlines) for power plants.

2. State SIPs Should Require Tighter Controls on Regional Power Plant Sulfur Dioxide and Nitrogen Dioxide Emissions

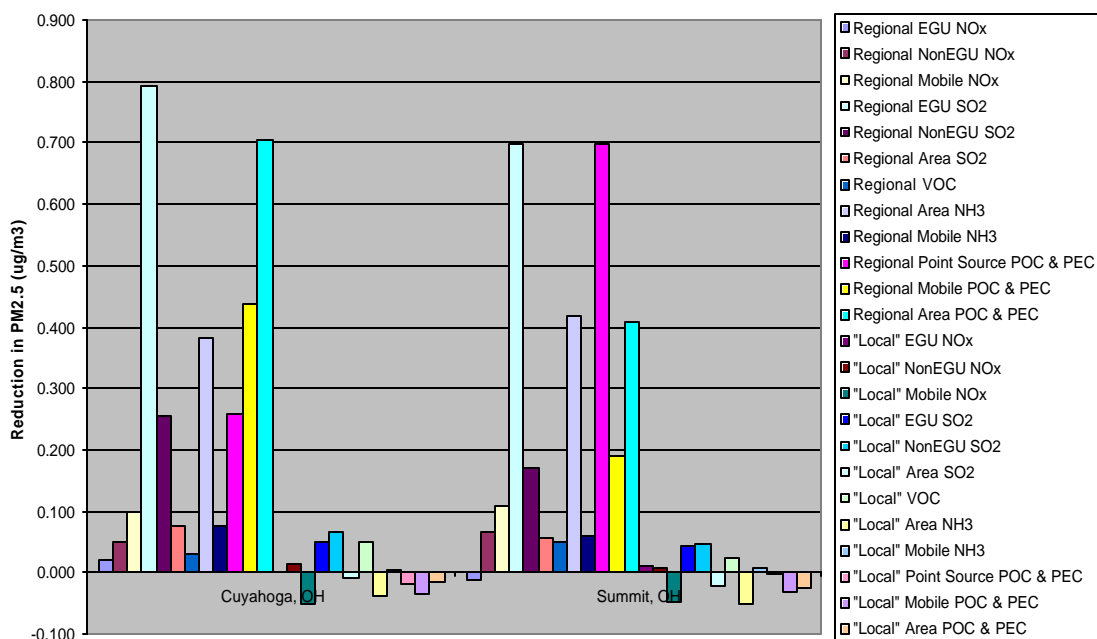
Given that the CAIR rule failed to achieve sufficient reductions from the power sector, states must consider where they will be able to find additional PM_{2.5} reductions beyond CAIR necessary to attain. Prudent policy would suggest that they will consider the most effective and cost-effective tons to pursue next. EPA's own analysis suggests that the few remaining nonattainment areas should seek additional sulfur dioxide reductions beyond CAIR from nearby upwind power plants.

As part of its responsibility to help states identify effective measures for inclusion in their PM_{2.5} SIPs, EPA's Office of Air Quality Planning and Standards (OAQPS) has evaluated the ambient PM_{2.5} improvements of a strategy of reducing each PM_{2.5} source category by 30 percent beyond CAIR in order to determine the relative efficacy of a variety of competing control strategies. Specifically, the analysis allows evaluation of potential emission reductions (i.e., per ton effect) and the magnitude of the projected emissions inventory for that factor (source/pollutant combo).¹⁵ Of special interest here, EPA staff has analyzed the benefits of this 30 percent policy in the key post-CAIR projected residual nonattainment counties of Ohio (Cuyahoga, Summit, Butler and Hamilton). In each case, EPA found that additional regional power plant sulfur dioxide reductions (denoted in the legend of the bar charts as "Regional EGU SO₂") were the most effective strategy, followed by regional reductions in organic and elemental carbon e.g., from diesel vehicles (denoted in the legend of the bar charts as "Regional POC & PEC"). See figures below:



¹⁵ http://www.epa.gov/scram001/reports/pmnaaqs_tsd_rsm_all_021606.pdf

**Impact on Cleveland Nonattainment Area of 30 Percent Reduction in Emissions Across Sectors and Pollutants for "Local (Chicago)" vs "Regional" Sources
(Cleveland Post-CAIR 2015 DV = 16.68)**

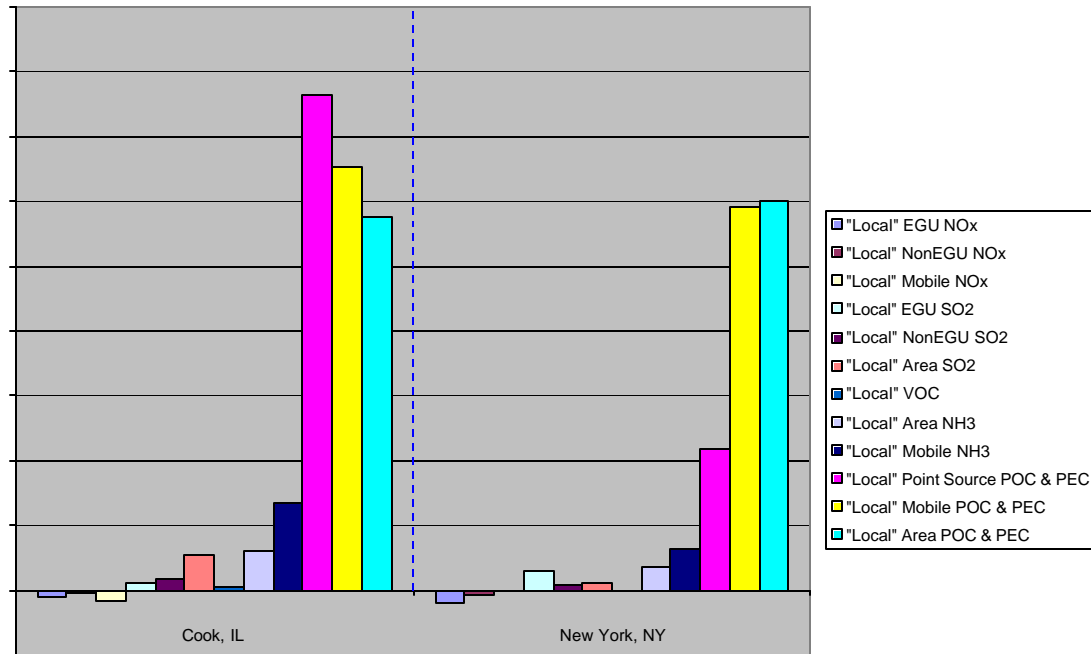


EPA OAQPS staff concluded from this analysis that “local and regional SO₂ controls, for both EGU and non EGU point sources remain an effective way to reduce PM_{2.5} concentrations in remaining Eastern post-CAIR nonattainment areas.”

3. States and Metropolitan Areas Should Require Retrofit Controls on Local Existing Diesel Fleets

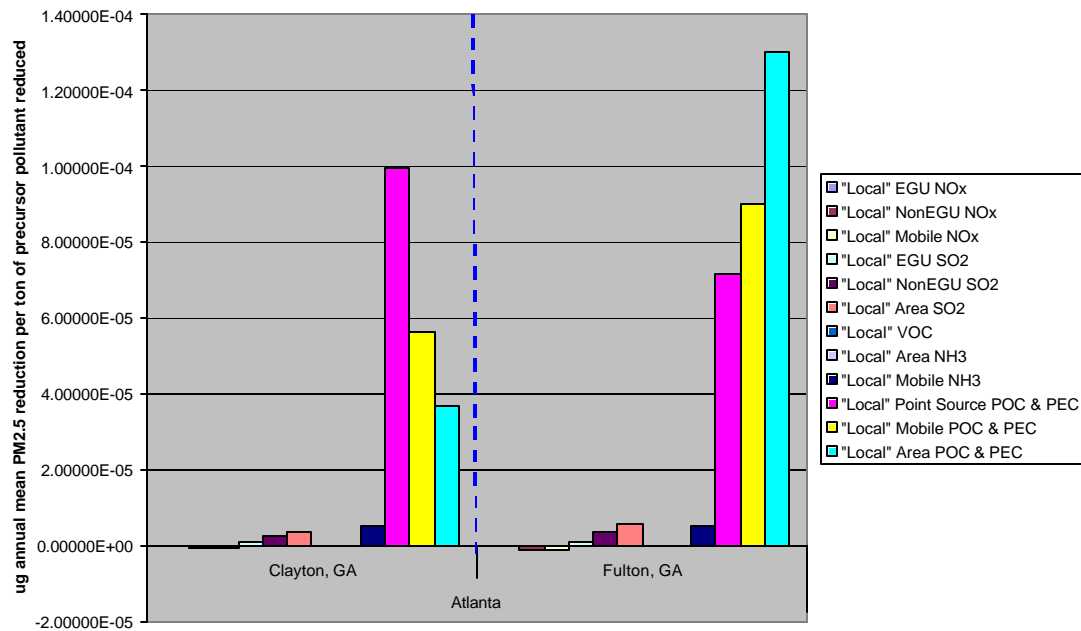
EPA staff’s “30 percent” analysis also demonstrates the effectiveness of regional and local controls on sources of organic and elemental carbon. The figures above document the outstanding benefits in Ohio counties of regional reductions in regional organic and elemental carbon (denoted in the legend of the bar graphs as “Local POC & PEC”). In other nonattainment areas, local carbon controls were found to be the most effective local strategies beyond CAIR. For example, in Chicago, New York, and Atlanta the most effective local strategies identified included reductions in point, mobile, and area organic and elemental carbon. However, the policy priority that should be given to diesel emission reduction (i.e., mobile POC and PEC) becomes clear when one recognizes (as EPA now does) that the diesel emissions inventory is likely understated by 2-5 times. Thus, diesel carbon reductions (mobile POC and PEC) in the bar charts should rise to the top of the list of priority local attainment strategies.

Relative Effectiveness Per Ton of "Local" Emission Reductions Across Sources and Precursor Pollutants



Relative effectiveness per ton in reducing ambient PM2.5 levels is only one factor in determining the appropriateness of controls. Cost effectiveness per microgram is the more complete measure, and reflects both the atmospheric response and costs of the controls.

Relative Effectiveness Per Ton of "Local" Emission Reductions Across Sources and Precursor Pollutants in Atlanta



From this analysis, EPA OAQPS staff concluded that “[o]n a per ton basis, carbon reductions are the most effective in reducing PM_{2.5} levels in most urban areas.”

Diesel particulate matter (e.g., organic and elemental carbon) emissions can be reduced by 90 percent for most existing diesel engines through the combination of a Diesel Particulate Filter and the use of Ultra Low Sulfur Diesel (ULSD) fuel. ULSD will be available throughout the U.S. starting in October of this year due to EPA’s new engine rules. Depending on the application, Diesel Particulate Filters (DPFs) typically cost less than \$10K per vehicle. Mandated diesel retrofits of this type on private fleets should be a major feature in the SIPs of the residual post-CAIR nonattainment areas. To help pay for retrofits for public fleets (e.g., transit, waste haulers, and school buses) in cash-strapped states and localities, federal grant and loan programs such as that envisioned by the Diesel Emission Reduction Act of 2005 will be critical. Authorized at \$200 million per year for five years, Congress so far this year is debating funding levels only one-tenth of that amount as part of EPA’s FY2007 budget. DERA should be fully-funded.

In sum, based on EPA’s most recent analysis of options for addressing nonattainment and what we know about the cost-effectiveness and feasibility of controls, one can conclude that a sound, feasible attainment strategy for remedying these “residual” post-CAIR nonattainment areas would include:

- (A) EPA setting a tighter national or regional cap on sulfur dioxide from power plants;
- (B) States requiring tighter sulfur dioxide controls on power plants that have a significant impact on nearby nonattainment areas;
- (C) EPA completing the process of tightening emission standards for new locomotive and marine diesel engines and issuing regulations that require existing, long-haul trucks meet tighter emission standards when their engines are rebuilt;
- (D) States and local governments requiring additional PM_{2.5} reductions from local diesel fleets.

E. Steep Reductions in PM_{2.5} are Cost-Benefit Justified

Steep reductions in PM_{2.5} from power plants and diesel engines are overwhelmingly cost-benefit justified. In the Regulatory Impact Analysis (RIA) to the CAIR rule, EPA found that the benefits of the required reductions exceeded costs by 10:1.¹⁶ Researchers at Resources for the Future found that power plant SO₂ study found cuts down to a national cap of one million tons per year were cost-benefit justified.¹⁷ EPA’s recent analysis of the Clean Air Planning Act (which included a much tighter SO₂ cap than in the CAIR rule,

¹⁶ EPA, Regulatory Impact Analysis for the Clean Air Interstate Rule EPA-452/R-05-002 March 2005 available online at: www.epa.gov/cair/pdfs/finaltech08.pdf

¹⁷ Spencer Banzhaf, Dallas Burtraw, and Karen Palmer, Efficient Emission Fees in the U.S. Electricity Sector, Discussion paper 02-45 Resources for the Future (October 2002) available online at: www.rff.org/Documents/RFF-DP-02-45.pdf

but also included steep cuts in nitrogen oxides and mercury) concluded that benefits exceeded costs by a factor of 10:1.¹⁸ In addition, this same analysis found that the CAPA caps would have virtually no impact on electricity prices and natural gas usage or prices. Similarly, in its RIA for the on- and non-road diesel rules, EPA found a benefit-cost ratio of 10:1.¹⁹ EPA found that the benefits of the DERA \$1B dollar, five-year program to retrofit existing diesel engines with particulate matter controls would yield up to 13 dollars in benefits for every dollar spent and an average benefit-cost ration of 10:1.²⁰

F. Ohio will benefit Most from Additional Reductions in Ohio Power Plant Emissions

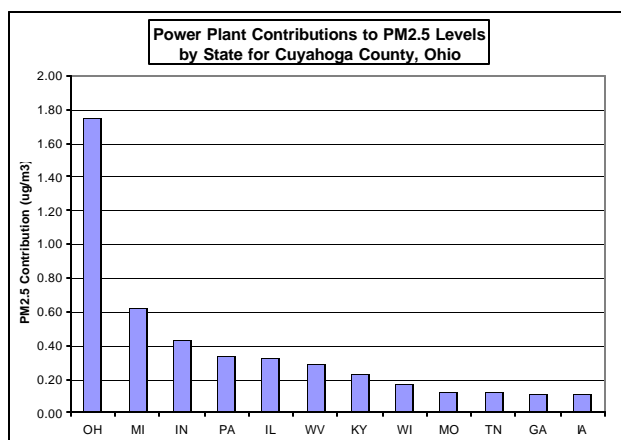
Perhaps it is stating the obvious that cuts in pollution at Ohio power plants will benefit the health of Ohioans most. But, given the history of argumentation over interstate transport of power plant pollution, it is important not to lose sight of the fact that Ohio's power plant pollution hurts Ohioans most, so cleaning it up will help Ohioans most. Of the over 2500 estimate particulate matter-related premature deaths in Ohio, over 1,700 come from power plant pollution.²¹ Indeed, Ohio's PM_{2.5} nonattainment problem is dominated by Ohio power plant pollution. Here, three graphs illustrate that the largest contribution to PM_{2.5} levels in Cuyahoga, Franklin, and Stark Counties come from Ohio power plants. Thus, reducing these emissions will benefit breathers in Ohio more than it will benefit citizens of any other state:

¹⁸ Multi-Pollutant Legislative Analysis: The Clean Air Planning Act (Carper, 2. 843 in the 108th) October 2005 available online at: <http://www.epa.gov/airmarkets/mp/carper.pdf>

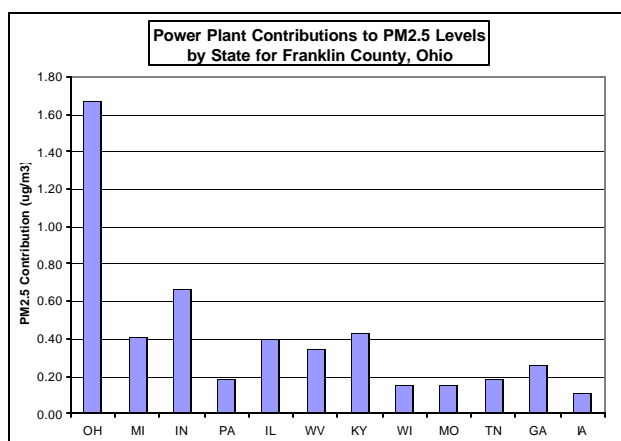
¹⁹ EPA, Final Regulatory Analysis: Control of Emissions from Nonroad Diesel Engines EPA420-R-04-007 May 2004.

²⁰ U.S. EPA fact sheet on the Diesel Emission Reduction Act September 2005.

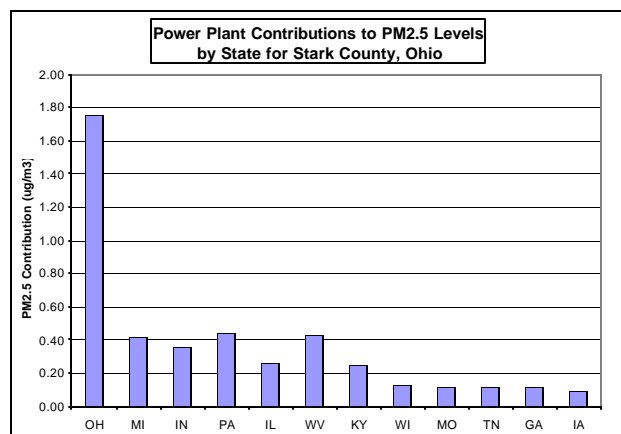
²¹ Clear the Air/Clean Air Task Force, Dirty Air, Dirty Power: Mortality and Health Damage Due to Air Pollution from Power Plants (June 2004) and Air Pollution Locator available at: <http://www.cleartheair.org/dirtypower/docs/dirtyAir.pdf>, the companion *pollution navigator* is available at: <http://www.cleartheair.org/dirtypower/>



Source: EPA



Source: EPA



Source: EPA

G. EPA Must Shoulder its Responsibilities in Helping States Achieve Timely Attainment

1. It is premature to conclude that implementation of new, tighter particulate standards will be difficult or prohibitively costly until EPA issues its final Regulatory Impact Analysis.

With respect to identifying and assessing the cost of implementation of the proposed new standards, EPA has yet to complete its work. The Regulatory Impact Analysis (RIA) issued with the proposed new particulate matter standards was woefully and woefully inadequate. For example, it failed to identify additional power plant controls as an important strategy for SIPs and failed even to mention mobile source strategies. We understand that EPA is in the process of substantially revising the RIA for the proposed standards. Until EPA has completed this work in an adequate manner, it is premature to conclude that the process of attaining these standards will be prohibitively expensive or difficult.

2. EPA must provide adequate implementation guidance to the states by finalizing its implementation rule.

Much of the angst regarding the proposed particulate matter standard derives from the fact that states have not yet grappled fully with the ramifications of attainment of the current standard. This situation has been exacerbated by EPA's delay in issuing final implementation regulations. In order to give the states adequate guidance as to what is expected, EPA must improve and finalize this guidance. The Clean Air Task Force and several other environmental organizations commented on EPA's proposed PM_{2.5} implementation rule in January 2006. Our comments are incorporated by reference herein and can be downloaded at <http://www.catf.us/advocacy/legal/PM25-NAAQS/>. The comments suggest numerous ways in which EPA can improve its implementation rule; I would like to emphasize three of those suggestions:

First, EPA is not free to regulate at it pleases – it must set PM standards according to the process set forth in Section 109 of the Clean Air Act, and then it must implement those standards consistent with the requirements of Sections 188-190, also known as Subpart 4. The Act directs EPA to establish air quality standards that are based on “the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of such pollutant in the ambient air.” CAA §109(b)(2). An adequate margin of safety must be built into the standard to take account of the “preventative and precautionary” nature of the Act. CAA §109(b)(1); *American Lung Ass’n v. EPA*, 134 F.3d 388, 389 (D.C. Cir 1998). The NAAQS must be set so as to protect “average healthy individuals” and “sensitive citizens” – children, for example,” that are “particularly vulnerable to air pollution.” *American Lung Ass’n*, 134 F.3d at 190.

The resulting standards drive the process by which EPA, States, and local governments cooperatively address conventional air pollution. For nonattainment areas, the path to

compliance is mapped out by Part D of Title I of the Act. Part D contains a set of generic requirements applicable to all criteria pollutants, as well as supplemental measures that were carefully designed by Congress to tackle particular pollutants.

The prescriptive pollutant-specific measures are indicative of a general legislative trend toward increased accountability and specificity. The 1970 and 1977 Amendments replaced a decentralized and largely ineffective scheme with compliance deadlines and mandatory control measures. In 1990, Congress added more detail to the NAAQS process by prescribing pollutant-specific strategies, after it recognized that generic controls measures were not bringing polluted areas into attainment fast enough. Subpart 4 of Part D, which prescribes detailed requirements for reducing particulate matter pollution, is among the measures that Congress added in 1990.

In adopting Subpart 4, Congress plainly intended to address the health threats presented by all particles encompassed by the PM₁₀ standard, including fine particles. The House Report on the 1990 Amendments expresses concern specifically about health effects from diesel emissions, smoke, and other combustion-related emissions that are significant sources of PM_{2.5}. Moreover, the control requirements in Subpart 4 are applicable and relevant to the control of PM_{2.5}. Indeed, such control requirements already apply to PM_{2.5} sources in PM₁₀ nonattainment areas.

EPA must therefore require PM_{2.5} nonattainment areas to adhere to the specific compliance schedules and control requirements described in Subpart 4. Those requirements include a mandate for attainment of the NAAQS as expeditiously as practicable, but no later than 6 years from designation for moderate areas, and 10 years for serious areas. CAA §188(c). They also require implementation of “reasonably available control measures” within 4 years, and implementation of “best available control measures” within 4 years of classification (or reclassification) to serious nonattainment. CAA §189. Subpart 4 further mandates control of precursor emissions, and achievement of rate-of-progress milestones. CAA §189(c), (e).

The second major point in our comments is that EPA’s proposed approach to regulating the chemical precursors to PM_{2.5} is neither scientifically nor legally supportable. The proposal inexplicably allows States to rebut a presumption that SO₂ and NO_x contribute to the amount of PM_{2.5} in a nonattainment area, and it creates a blanket presumption that ammonia and volatile organic compounds do *not* contribute to PM nonattainment. In fact, recent analysis by EPA’s own Office of Air Quality Planning and Standards (OAQPS) suggests that ammonia control is a very effective strategy in many areas.

Each of the Act’s nonattainment area requirements apply to PM_{2.5} precursors except where a State or Tribe makes a rigorous technical demonstration that a given precursor does not contribute to PM_{2.5} nonattainment, and that reducing emissions of the precursor would not contribute to reasonable further progress or timely attainment. CAA §189(e). Accordingly, SO₂ and NO_x must be treated as PM_{2.5} precursors at all times, due to the overwhelming scientific evidence that links them to PM formation. Scientific evidence also indicates that ammonia and volatile organic compounds must be treated as

presumptive precursors, to be regulated unless and until EPA determines that they do not contribute to nonattainment in a given area. EPA cannot fulfill its statutory obligation to help States attain the NAAQS “as expeditiously as practicable,” *see* CAA §§172(a), 188(c), if it excludes known PM_{2.5} precursors from regulation.

Finally, EPA cannot use the Clean Air Interstate Rule (CAIR) to categorically displace existing Clean Air Act requirements that apply to power plants. Under EPA’s proposal, if a State meets its CAIR obligations entirely through emissions reductions from power plants, EPA would determine that power plants in that State meet the “reasonably available control technology” requirement (“RACT”) for SO₂ and NO_x. In effect, power plants – which are responsible for more PM_{2.5} pollution than any other category – would be exempt from the Act’s RACT requirement. EPA’s exemption for power plants means that communities that are not brought into attainment by CAIR will be forced to consider alternative reduction strategies that are less efficient and less cost-effective than power plant RACT controls.

The residents of nonattainment areas need geographically targeted reductions, which CAIR will not always provide. CAIR, like all regional- or national-scale cap-and-trade systems, can be an efficient and effective method of reducing total emissions over large regions, but it does not assure pollution reductions in a specific community by a specific amount according to a specific schedule. EPA’s argument against source-specific control requirements – *i.e.*, that they would not affect total emissions – misses the point entirely. The NAAQS attainment process is not, as EPA seems to believe, an exercise in achieving the most cost-effective emissions reductions regardless of where they occur. Rather, it was designed by Congress to reduce the level of pollution in the areas that have unhealthy air.

3. EPA can help states achieve attainment by adopting federal control measures and refraining from hampering states’ efforts to develop cost-effective regional controls

As discussed above, the first thing EPA can do to aid states in developing adequate SIPs is to recognize that for many areas in the Eastern U.S., the most cost-effective attainment strategy beyond the CAIR rule is additional reductions in power sector sulfur dioxide emissions. EPA should desist in its efforts to dissuade states from pursuing this course of action and remove the current legal and policy roadblocks it has erected.

Secondly, EPA should expeditiously finalize the locomotive and marine portion of the non-road diesel rule. At the time the rest of the non-road diesel rule was finalized, EPA decided delayed finalizing the new engine emission standards for locomotives and certain marine vessels. These engines are the source of avoidable particulate matter emissions and EPA should move quickly to finalize stringent new standards.

Lastly, while the new emissions standards for on-road engines eventually will lead to significant reductions in particulate matter emissions from trucks and other vehicles, due to the durability of the diesel fleet and slow turnover of these vehicles, the full benefits of

this program will not be realized for decades, too late to provide states meaningful help in meeting near-term attainment deadlines. EPA has the opportunity and the legal authority under the Clean Air Act to require that on-road engines meet more stringent emission standards when these engines are rebuilt. Many truck engines are driven over one million miles during their useful lives. Typically, these engines are rebuilt at least once during that period. Requiring these engines to meet stricter emission standards when they are rebuilt would mean deeper reductions sooner. Federal action on interstate trucks is particularly appropriate given that these trucks constitute a large percentage of the on-road diesel particulate matter inventory but are generally beyond the reach of state regulation in SIPs.

H. EPA Should Engage States and Regional Air Agencies in SIP Planning Processes

From the experience of the Clean Air Task Force and our affiliated state and local allied organizations, we are aware that many states are just beginning to focus on the issue of PM_{2.5} nonattainment. Many of these states have been in nonattainment of the ozone standards for some time, are more accustomed to working on ozone issues, and thus have devoted the lion's share of their attention to their ozone SIPs. Ozone SIPs are also due first. For other states, PM_{2.5} nonattainment is their first real experience with nonattainment and they need guidance and assistance in developing adequate SIP measures.

One of the first areas to grapple with PM_{2.5} SIP-planning has been the Mid-Ohio Regional Planning Commission (MORPC) which sponsored a diesel stakeholder's process to develop the diesel component of its PM_{2.5} SIP. The process included participants such as private and public diesel fleet managers, diesel engine manufacturers, state and local government officials, and environmental organizations. The process was professionally facilitated with financial support from U.S. EPA. The MORPC process resulted in a consensus set of recommendations that MORPC has forwarded to Ohio EPA for consideration in developing the SIP. However, this process was one of the first of its kind around the U.S. New Jersey last year recognized the seriousness of its PM_{2.5} attainment challenge and moved to pass legislation setting emission standards for certain diesel fleets and funded the public fleet component of this clean up requirement by tapping an underutilized hazardous waste fund.

Regional air planning agencies such as the Lake Michigan Air Directors Consortium (LADCO), the Northeast States for Coordinate Air Use Management (NESCAUM), Mid-Atlantic Regional Air Management Association (MARAMA), Southeastern States Air Resource Managers (SESARM), and the Ozone Transport Commission have begun to examine basic strategies and evaluate control measures, but with SIP submission deadlines looming in the next 12-24 months, EPA and the states should view today's hearing as a "wake-up" call to quicken the pace of PM_{2.5} SIP development.

I. NAAQS-Setting Process Issues

The Utility Air Regulatory Group (UARG), a trade group representing coal generators, at a recent EPA NAAQS workshop sponsored by the Office of Air Quality Planning and Standards (OAQPS) in North Carolina called for lengthening the current statutory timetable for revising the national ambient air quality standards (NAAQS) from 5 years 8-10 years. Furthermore, UARG argued that if EPA fails to revise the standard during that prescribed time period, EPA should forego the authority to revise it until another 8-10 year period has passed. Legislation amending the Clean Air Act in this fashion would strike a devastating blow against air policy based on sound science. One need only look at the significant number of new articles linking particulate matter to lower ambient concentrations that have been published since the last revision to see that five years is not too short a time for the scientific underpinning of the standard to become outdated. A regularly-evaluated NAAQS allows EPA and the states to ensure that the policy target for their controls measures is based on best available science. Science-driven policy targets should be a consensus goal for environmental policy regardless of political party affiliation or philosophy. Indeed, a well-founded health-based target is important to add legitimacy for implementation efforts. For example, the management of industries, such as the power industry, should be able to clearly articulate to their boards of directors and shareholders exactly why the corporation is being asked to spend money on compliance. A policy target based on sound, up-to-date science allows this.

EPA does have a poor track record of meeting the 5-year revision requirement. The chart below documents EPA's record in revising the NAAQS for the variety of criteria pollutants since passage of the Clean Air Act in 1970.

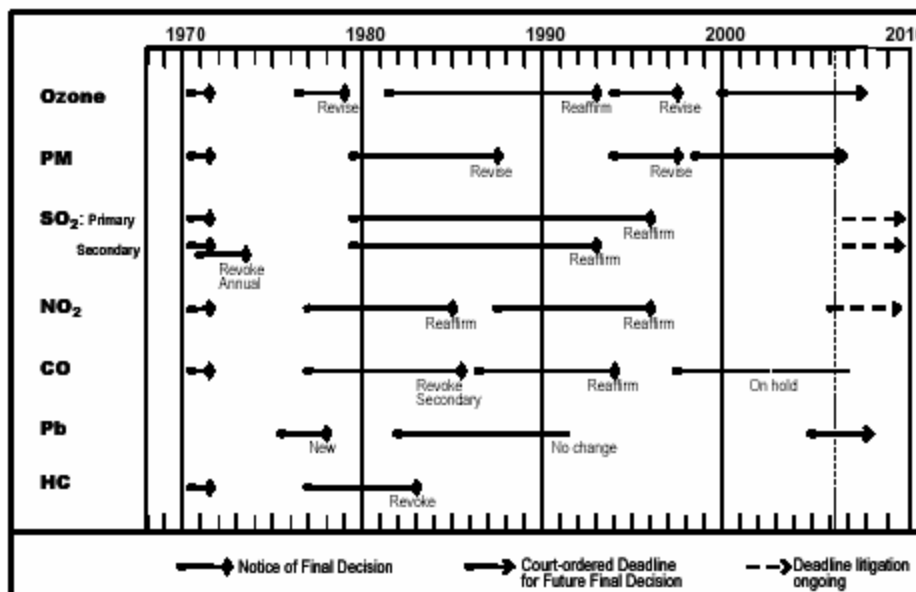


Figure 1. History of NAAQS Reviews: 1970 – Present

But the answer to this problem is not to extend the period of the review. Nor is it to eliminate the EPA Staff Paper from the NAAQS-setting process.

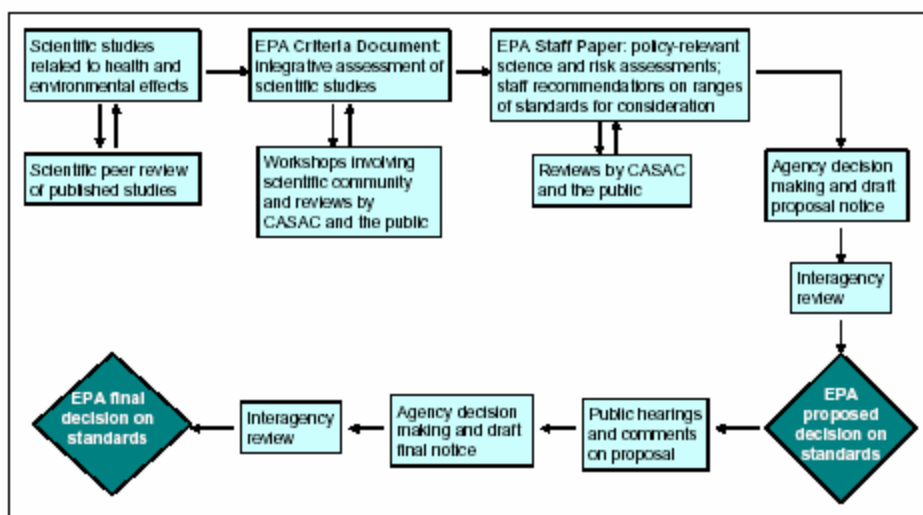


Figure 2. Current NAAQS Review Process

The flow chart above sets out the steps in the process by which EPA sets the NAAQS. Although not directly relevant to the current round of particulate matter standard revision, the recent proposal by the Assistant Administrator for Air and Radiation to drop the Staff Paper (and EPA staff's interaction with the Clean Air Science Advisory Committee or CASAC) from this process in the future and replace it with agency position set by political appointees threatens to "politicize" what to date has been an excellent example of science-based policy. EPA should reject, and Congress should not support, this shift. Indeed, Congress should insist that EPA return to its previous practice. The Staff Paper is part of a proper and time-tested deliberative process of making recommendations about NAAQS revisions to the EPA Administrator. While the Criteria Document serves as the repository of all the scientific studies published since the previous revision, the Staff Paper provides the best policy recommendations by career EPA staff. First, it is important to keep science and policy separate and the bifurcation between the Criteria Document and the Staff Paper achieves this goal. Secondly, it is important not to politicize the consideration of a standard revision early in the process. The flow chart above recognizes that a NAAQS proposal ultimately will go through public hearings and interagency review (including by the White House), but the Staff Paper offers the opportunity for EPA staff to express recommendations for the Administrator unconstrained by political concerns and should be preserved.

In practice, it is doubtful that revisions that strengthen the ambient standards will occur without clear institutional responsibility for driving the process. The Staff Paper process in conjunction with CASAC review has worked well in the past to advance sound science-based policy. EPA has not made the case that there is sufficient reason to scrap this key piece of good deliberative process.

Conclusion

In conclusion, particulate matter is the most important pollutant that EPA regulates. Setting protective air quality standards for particulate and implementing them should be EPA's top environmental health priority. As EPA acknowledges by proposing to revise the particulate matter standards, the current PM_{2.5} standard is not adequately protective of public health. However, given numerous health studies that peg serious adverse health effects to much lower ambient levels, EPA's proposed revision to the standard too is be insufficient and must be strengthened.

Although the Supreme Court has made it clear that EPA may not take into account issues of cost and implementation in the NAAQS-setting process, this Subcommittee has solicited testimony from elected officials and, industry representatives whose only interest in these matters is cost and implementation concerns. As a result, the Clean Air Task Force has provided evidence that complying with stricter particulate matter standards is achievable, cost-benefit justified, and can be met with affordable, available technologies that will not damage America's economy. We urge the members of this Subcommittee to support the requisite tightening of the standards to adequately protect public health and to support the efforts of EPA and the states in achieving them in a timely fashion.

Thank you for your kind attention. I would be happy to answer any questions the Subcommittee members may have.



MEMORANDUM

TO: Conrad Schneider
FROM: David Schoengold
SUBJECT: The Health Benefits of Meeting Alternative PM2.5 Attainment
Thresholds
DATE: March 23, 2006

Introduction

This paper analyzes the health benefits (in terms of reduced mortality) which can be achieved by meeting attainment thresholds for PM2.5. It looks at meeting the current standard of 15.05 ug per m³ as well as standards better than that. This work is based on previous work done by Abt Associates which was reported in their paper, "Power Plant Emissions: Particulate Matter-Related Health Damages and the Benefit of Alternative Emission Reduction Scenarios," June 2004.

Method

The Abt Associates paper presents a set of equations relating changes in PM2.5 concentrations at the county level to changes in the mortality rate for an area.¹ The equation is an exponential with the following format:

$$\text{Delta Mortality Rate} = -(Y_0 * (\text{EXP}(-\text{BETA} * \text{dPM2.5}) - 1))$$

where Y_0 = the county level death rate
 dPM2.5 = the change in the PM2.5 concentration
 $\text{Beta} = 0.0046257$.

County level populations and average death rates were obtained from the U.S. Census Bureau. A separate equation was set up for each county in the U.S.

In order to determine the health benefit of achieving attainment, it was necessary to determine the starting point which is the current PM2.5 concentration level by county. For these values the EPA's reported PM2.5 design values were used. Each year the EPA reports PM2.5 values for the previous three years. In this analysis we used design values for 1999-2001, 2000-2002, and 2001-2003. The design value levels have, in general,

¹ The specific equations used are from Appendix A, page A-1.

been decreasing. Design values are not reported for all counties, but only for those with monitors. In 1999-2001, there are 307 counties with reported design values. For 2000-2002 there are 516, and for 2001-2003 there are 533. No estimates were prepared for the other counties.

The numbers reported in this paper are based on the 2001-2003 design values.

Results

There are 82 counties with reported 2001-2003 design values greater than or equal to 15.05 ug per m³. This analysis reports the benefit of each of these counties reducing the current PM2.5 level to 15.05. It does not include any benefit which is likely to occur in other counties when the actions taken to lower the PM2.5 concentrations in nonattainment counties also reduces the PM2.5 concentrations in counties which are currently in attainment.

We also analyzed the benefits in terms of additional mortality reductions from using a lower attainment threshold than 15.05. Specifically, we looked at 14.0 and 12.0. The benefits in reduced mortality are shown in the table below.

Table 1. Reduced Mortality Benefits of PM2.5 Attainment
(annual deaths)

Attainment <i>Level</i>	Reduction in <i>Mortality</i>
15.05 ug/m ³	7,420
14.00 ug/m ³	10,090
12.00 ug/m ³	17,860

Table 2. Benefit of a Lower Attainment Threshold

Reduction <i>In Threshold</i>	Additional <i>Lives Saved</i>
From 15.05 to 14.00	2,670

From 15.05 to 12.00	10,440
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From 14.00 to 12.00	7,770
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Conclusion

Meeting a lower threshold for PM2.5 attainment will save many thousands of additional lives compared to meeting an attainment level of 15.05 ug per m³.